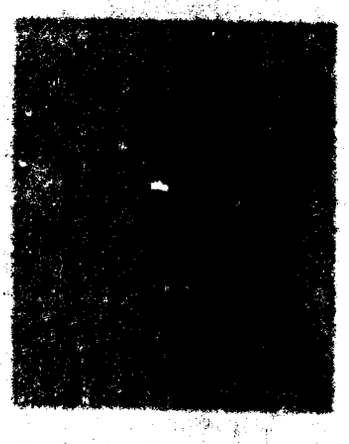

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Technical Report

AD 640 113

MECHANIZATION STUDY OF THE DMIC, BDIC, RACIC, AND REIC INFORMATION CENTERS OF THE BATTELLE MEMORIAL INSTITUTE, COLUMBUS, OHIO

Submitted to

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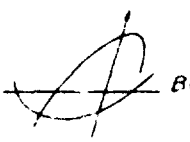
September 1966



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ABSTRACT

Four of the information centers operated by the Battelle Memorial Institute were included in the BAARINC Library Mechanization Study. The CDC 3400 computer is used for any mechanization although this was not extensive at the time of the survey. A Flexowriter is used by BDIAC to produce a monthly list of documents for security classification downgrading and by REIC to produce a monthly accessions list with abstracts and a coordinate index, and a semiannual compilation of government-sponsored contracts relating to radiation-effects research. RACIC uses Flexowriter edge-punched cards to produce a security log of secret cards in the file. DMIC uses a Termatrex coordinate index system to store and retrieve references to government-sponsored contracts of interest to the Center. REIC uses a mechanized process to punch EAM cards which are used to produce a listing of clue words and a listing of reports with accession numbers. REIC has also initiated the development of a thesaurus. RACIC has mechanized its listing of clue words and is experimenting with a computer program to produce a clue-word coordinate index from a file of EAM punched cards. All four centers consider that their manually produced and searched files of extracts are preferable to a computerized system. However, they feel that additional mechanization of their printed outputs would be desirable as a time-saving feature wherever it would prove economical.

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A P P E N D I C E S

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I. SUMMARY

Four of the information centers operated by the Battelle Memorial Institute were included in the Library Mechanization Study and are discussed in this report. They are as follows:

1. Radiation Effects Information Center (REIC)
2. Remote Area Conflict Information Center (RACIC)
3. Battelle-DEFENDER Information Analysis Center (BDIAC)
4. Defense Metals Information Center (DMIC)

At the time of the survey, none of these centers was making extensive use of mechanization.

REIC uses a Flexowriter to produce a monthly accessions list with abstracts and a coordinate index, and a semiannual compilation of government-sponsored contracts that apply to radiation-effects research. The Center uses a mechanized process to punch EAM cards which in turn produce the following: a listing of the "clue words," used for subject indexing in the information filing system; a listing of processed, rejected, and ordered reports with accession numbers for use in duplication checking. In addition, the Center has initiated the development of a thesaurus prior to the mechanization of the coordinate index to its selected monthly accessions list.

RACIC is experimenting with a computer program to produce a clue-word coordinate index from a file of EAM punched cards. The Center has mechanized its listing of clue words and is using Flexowriter edge-punched cards to produce a security log of secret cards in the file.

BDIAC uses a Flexowriter to produce a monthly list of documents for security classification downgrading.

DMIC uses a Termatrex coordinate index system to store and retrieve references to government-sponsored contracts of interest to the Center.

BDIAC and DMIC elected not to introduce computer processing because of the adequacy of their present manual systems and the relative stability of their present clue-word collections. DMIC has, however, an experimental project to produce a machine-readable record on punched paper tape of each new accession reference added to their data file. This tape was requested by the Material Information Branch of Wright-Patterson Air Force Base to be used in an experimental mechanized information retrieval system.

The administrative organization of the centers within the Institute is shown in Appendix A. The four centers are currently operated under government contracts. Subject to the control of their sponsoring agencies,

they provide service to U. S. government agencies, their contractors, suppliers, and other authorized users such as universities and research institutes. These services include direct answers to requests for information and publication of accessions lists, bibliographies, formal reports, technical memoranda, technical notes, and state-of-the-art reports.

When a visitor comes to a center, he is assisted by the staff in pursuing his interest through the files, and conferences with appropriate scientists and engineers are arranged. Copies of extract cards are made available to him for his own use. A request by telephone or mail is referred directly to the proper engineer, and a copy is sent to the information specialist concerned. An appropriate reply is then developed by the engineer, with whatever assistance from the information specialist that is deemed necessary. Inquiries that are not considered to require the degree of engineering judgment which the technical specialists can provide are referred directly to the information specialists for reply. However, the drafts to such replies may be subject to the approval of the technical specialists concerned.

The data base in each center consists of filed 5 x 8 cards containing extracted information from technical reports, journal articles, correspondence, trip reports, conference papers, books, and any other

material that may be pertinent. The extract, a unique feature of the Battelle system, is the reference element of the data base containing segments of actual text, charts, graphs, tables, and the like. The holdings amount to about 60,000 extract card references in DMIC, 25,000 in REIC, 16,000 in RACIC, and 10,000 in BDIAC. Each center acquires material related only to its own field of interest and endeavors not to duplicate material in any of the other centers. The centers have conducted selective retrospective literature searches to develop detailed backgrounds in their areas of specialty. Active acquisition efforts are engaged in by each of the centers so that current information is available to the users of the centers

After a desired item is received and checked into one of the centers, it is given to one of the Institute staff scientists or information specialists who marks important pertinent information for extraction. (Staff scientists devote up to 25 percent of their time to this activity; the average in DMIC is 17 percent.) In addition to the information to be extracted, certain clue words are underlined for use in subject-filing the extract.

The clue words are not subject headings or keywords from a pre-established thesaurus but are words which, in the opinion of the specialist or scientist performing the review, provide the best clues to the content.

New clue words may be added to the clue-word list any time it is necessary. Besides the clue words, bibliographic entries (author, journal, contract number, etc.) are also indicated.

The item with bibliographic data, clue words, and portions to be extracted (all indicated by hand markings) then goes to the typing pool where the extracts to be added to the files are typed on multilith masters in 5 x 8 card format. Graphic material, if it is to be included, is reduced to fit the 5 x 8 card format through the use of photodirect multilith masters.

A complete set of cards is then produced to be filed under each underlined clue word and bibliographic entry in the extract. Filing under each clue word is random. An example of a set of cards is shown in Appendix B. The original document may be placed in the center for more extensive perusal or sent to the Institute Library. (BDIAC retains all original items processed.) An objective of the extract system, however, is to minimize the necessity for reference to original documents, insofar as this is economically feasible.

II. MECHANIZATION

1. CHRONOLOGY

The Radiation Effects Information Center decided in May 1957 that the rate of change of their clue-word collection justified the use of an EAM punched card file of the words and high-speed punching of the cards by computer. The first printout of the mechanized clue-word list was in October 1957 following the punching of the clue-word collection on EAM cards. In early 1959, the Center identified a need for a single means of listing AEC documents by AEC report number for loan purposes. (AEC documents represent 40 percent of the incoming material.) The first printout of the list occurred three months later after the necessary references were keypunched.

The Remote Area Conflict Information Center began consideration of mechanized process applications when the Center was established in April 1963. The first machine-produced clue-word listing was made in February 1964 from an EAM punched card file of 200 clue words. By February 1965, the card file had been increased to 990 words and by May to 2,500 words. Currently, the Center is experimenting with a computer program to produce a clue-word coordinate index with links to be used with their manually produced accession/abstract publication.

This index is intended to be used with the Center's accessions list by clients in remote areas for their own retrospective search and selection of desired documents.

2. DESCRIPTION OF PROCESSES

(1) REIC

1. Monthly Accessions List

An information specialist prepares an abstract of the documents to be included and assigns clue words for the coordinate index. A draft is typed, and a punched tape is produced on a Flexowriter. The draft is edited, and the edited tapes are used to prepare the accessions list.

A page of the accessions list (August 1965) is illustrated in Appendix C-1, and a page from the corresponding coordinate index (October 1964 through September 1965) is shown in Appendix C-2a with an explanation of the index given in Appendix C-2b.

The list contains selected documents from the month's acquisitions. The coordinate index is produced monthly on a cumulative basis with a dual coordinate index prepared annually on a contract year basis (November 1 - October 31). It is

intended for users who desire to perform their own retrospective searches. Both publications are distributed to a mailing list of about 900 names, representing about 800 companies.

2. Contract List

A form is sent to the contractor or his sponsor or both requesting information on title, termination date, contract number, sponsor, contract monitor, contractor, chief investigator, and a brief description of the program as it applies to radiation-effects research. When this information is received from the various contractors, it is reviewed by an information specialist and the Project Director to determine the relevancy of the contract to the REIC's field of interest. The edited and correctly formatted contract information is entered on punched paper tape by a Flexowriter. The punched paper tape is attached to control cards on which the typed information appears. The paper tape and associated control cards are sorted into subject categories prior to printout of the compilation. A contractor and contract number index is prepared manually for the compilation.

A printout of the contract information from the tape is produced twice a year and averages 110 to 115 pages for each run. This document formerly was classified Confidential but is now unclassified and is distributed to qualified users.

3. Clue-Word List

The clue-word list contains about 18,000 words at present, and about 1,000 new terms are being added each year. They are numerically keypunched on EAM cards, coded, and filed manually in a card file that is manually updated continuously as new clue words are reflected. Filing of the EAM cards is by the code number.

The machine-produced clue-word list, which is updated at intervals of one to one and a half years, is printed from the EAM card file and is made available to assist the Center's users in determining applicable clue words.

4. Report Number List

When reports which have recognized alphanumeric report numbers* are received or are learned of through the Center's screening program, they are entered into the Report

* H. B. Mayfield, et al., "Report Number Series," TID-85, U.S. AEC.

Number List. When a reference to a report of interest is obtained, the report number is manually entered in the list. When the full-length copy is obtained, an accession number is assigned and entered both on the report and in the Report Number List with the associated report number. Periodically the hand-posted entries are keypunched on EAM cards. From this card file, a list is printed out alphabetically by report numbers with associated accession numbers. Appendix C-2c shows the format. Reports with different recognized report number series are cross-referenced. It is used to show holdings and to check for duplication of documents at the time of ordering or receipt or both. It has been updated 12 to 14 times in the past eight years.

(2) RACIC

1. Clue-Word List

Clue words used in the Center's files are each keypunched on an EAM card. Also punched on cards are card sequence number, a clue-word classification number, and the higher order hierarchical clue word (if any). This format is shown in Appendix C-3 along with a page of the

Clue-Word List (Appendix C-4) to which the illustrated EAM cards apply. The classification numbers are used in sorting the clue-word file into one of six general subject areas. In addition, a completely alphabetical listing is prepared by merging all six subject areas and suppressing duplicate entries. These are as follows:

Classification Number	Area
1	Biological Science
2	Chemistry
3	Electronics and Communication
4	Mobility
5	Social Studies
6	Weapons

In the mechanized printing of the clue-word list, however, the numbers are not printed.

2. Clue-Word Index

The Center is experimenting with a computerized coordinate index of terms with related accession numbers and utilizing links and roles. A controlled thesaurus with specific-to-general relationships is part of the overall system. Appendix C-5 illustrates three of the EAM cards

being used in the experiment; these samples do not have the links or codes punched. The list is machine-produced from EAM cards. Appendix D illustrates the present card format, the magnetic tape file structure, and the programs, but, since this project is still experimental, these forms may change.

(3) BDIAC—Security Classification Downgrading List

The following information is keypunched on EAM cards for the classified documents: accession number, downgrading group number, classification, and document date. These cards are run periodically to produce a list of documents for downgrading.

(4) DMIC—Flexowriter Format for Computer Input

The Center has prepared, at the request of the Materials Information Branch at Wright-Patterson Air Force Base, a record format on Flexowriter punched paper tape suitable for use in an experimental information retrieval program. This program will provide, in machine-readable form, both bibliographic data and subject category identification. The same tapes may be used internally to produce DMIC's accessions list.

III. PROGRAM SYSTEM DATA

Two experimental systems are discussed in this section. One is RACIC's system for producing a clue-word coordinate index; the other is DMIC's machine-readable record on punched paper tape.

1. RACIC—DESCRIPTION OF FILES AND RUNS

The following magnetic tape files are used in the experimental runs for RACIC: Thesaurus Tape, Index File Update Tape, and Index File Tape.

The formats for these three tapes are shown in Appendices D-2 and D-3. EAM punched cards are used to convey updating information for each update run; these are described in Appendix D-1. Each card has a code number punched in column 80 according to how the information on the card is to be used.

Five operations are performed with these files:

Update Thesaurus Tape

Generic Posting Generation

Update Index File

Search and Retrieval

Print Files

These runs are illustrated in Appendices D-2 to D-5.

In the Update Thesaurus run, new terms (clue words) and all corresponding broader, narrower, and related terms (if any) are each punched on a separate EAM card. These are combined with Type 8 deletion cards, overpunch deletion cards, and the old thesaurus tape to produce the updated thesaurus tape. Index addition cards, which do not contain generic references, are then run with the updated thesaurus tape to produce an expanded update index file which contains new terms, their higher generic correspondents, accession numbers, roles, and links. This is combined with deletion cards and the old index file to produce the updated index file. Search and retrieval are possible by reading cards containing a logical statement of the search request expressed as terms, roles, and the logical operators AND, OR, and NOT, and comparing this stated request with the entries in the index file. The files themselves may be printed out in three ways as indicated in Appendix D-5 and as specified by the input cards.

2. DMIC—DESCRIPTION OF PAPER TAPE FILE

A paper tape of each new item record in the DMIC is being prepared for use as input to an experimental information retrieval system. The tape is made on a Flexowriter as a by-product of the typing of normal bibliographic records. However, certain symbols are included in the typing which, while not appearing on the page copy, occur in the punched paper tape. These nonprint symbols are used to set off information fields.

Appendix E is an illustration of a typical record with the nonprint symbols included as underlined letters. The record begins with a series of five carriage returns followed by DMIC's control number and accession number in a fixed field of 39 characters. (The control number occupies the first 32 characters of the field and is provided for computer reference in searching on several items, e.g., company, contract number, journal title, etc.) This field and the others are separated from one another by two carriage returns and a tabulate shift. The second field is the author line with each separated by two spaces. The two-space entry identifies for the computer the boundaries of the "phrases."

The third field contains the title. Corporate author or journal title appears in the fourth field. The fifth field contains a subject category code for materials class and linking index terms. Where several classes of materials are involved, a field for each class is used.

Three spaces separate the subject code and the index term; the index terms are separated from each other by two spaces. The end of the record is indicated by three backspaces. Empty fields are accounted for by two backspaces following the boundary marker which indicates the beginning of the field. However, each character in the control number field must be accounted for; this is accomplished with four plus signs in place of any missing elements and zeros if the element does not fill the sort.

IV. EQUIPMENT, COSTS, AND EVALUATION

1. EQUIPMENT

CDC 3400	Battelle's Digital Computer Facility uses a Control Data 3400 and associated peripheral equipment. The CDC 3400 will be replaced by a CDC 6600 in mid-1966.
	Central processor with 32K 48-bit words of internal storage
6	IBM compatible tape units
	1,000 line-per-minute printer
	1,200 card-per-minute reader
	250 card-per-minute punch
	on-line point plotter
	paper tape reader/punch
	The facility also includes the following:
082	sorter
514	reproducer
077	collator
OSCAR J	oscillograph reader coupled to a 16-mm single-frame projector

2. COSTS

RACIC

- Development of clue-word index program—16 man-hours
- Keypunching (clue-word list and index)—10 man-months
- Computer (average for all RACIC users)—$270/month

REIC

- Flexowriter (including tape, amortization, etc.)—$140/month
- Development of clue-word list system—one man-month
- Computer and keypunching (average for card coding, keypunching, updating, printing, etc.)—$2,000/year

3. FACILITY'S EVALUATION OF SYSTEM

All four centers consider that their manually produced and searched files of extracts are preferable to a computerized system. They point out that up to 80 percent of the requests for information can be answered by direct reference to the extract files alone. In addition, a user of the files is automatically "referred" to other positions of the files by other clue words underlined on the cards he is using. A user who makes a personal visit to the centers, usually on a tight air travel schedule, has immediate access to the information itself, not merely to bibliographic citations. Furthermore, the subject specialists who deal with telephone queries often can answer questions on the spot by reference to the files. On the other hand, additional mechanization of the Centers' printed outputs would be considered desirable for time-saving features where it is economically advantageous.

The use of links in a coordinate index such as RACIC's experimental clue-word index with accession numbers is considered valuable. It is felt that roles, however, would have a lesser utility.

The use of a coordinate index system, where introduced, will probably remain as an auxiliary to the existing system of "clue words-in-context," since there is only a limited demand for information involving combinations of environments, etc.

B I B L I O G R A P H Y

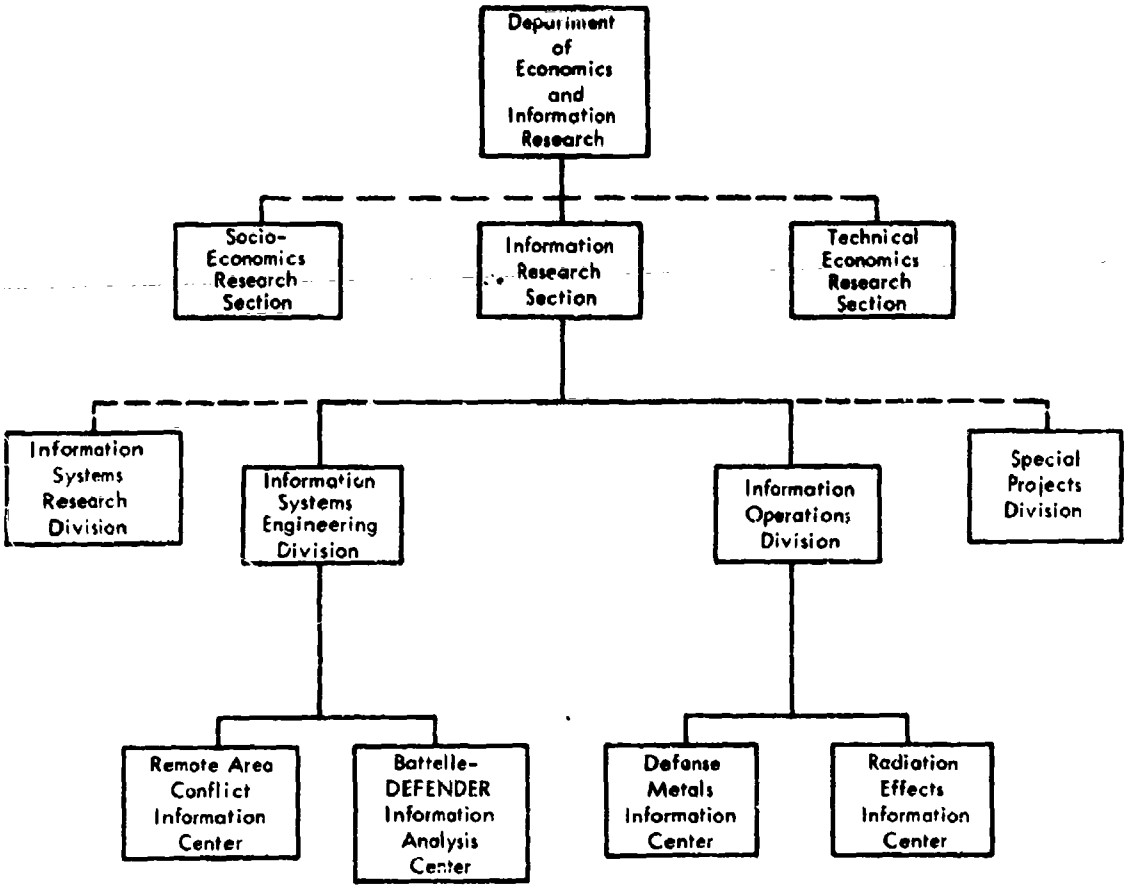
1. The Operation and Management of Scientific Information Centers at Battelle, by A. B. Westerman, Battelle Memorial Institute.

2. Battelle-DEFENDER Information Analysis Center, brochure, Battelle Memorial Institute.

3. Remote Area Conflict Information Center, brochure, Battelle Memorial Institute.

4. DMIC Flexowriter Format for Preparation of Materials Information Branch Computer Input, draft instruction, Battelle Memorial Institute.

ORGANIZATION CHART OF FOUR CENTERS
WITHIN BATTELLE MEMORIAL INSTITUTE



This chart does not reflect overall Battelle organization, nor does it show the relationship of the centers to the other divisions of Battelle, many of which are highly involved with operations.

Bonded specimens have been annealed for ten hours at the respective bonding temperatures and tested over a range of cryogenic and elevated temperatures. The testing of this series of specimens is essentially complete and baseline data on as-bonded joints are also available for comparison purposes.

...

2.1 HEAT TREATMENT OF TD NICKEL

Two diffusion heat treatments are to be used with the TD Nickel/Palladium-nickel system -

10 hours at 2100°F 10 hours at 2400°F

Two attempts have been made to vacuum anneal (NiB) TD nickel specimens at 2100°F at vacuums of 5×10^{-6} Torr, but evaporation of nickel onto the furnace heating element caused localized heating and melting. Annealing in a hydrogen atmosphere provided an alternative but subsequent microexamination of heat treated specimens revealed extensive void formation....Exploratory bonds were made with pure palladium foil and 60 Pd-40 Ni foil rolled from 1/16 inch diameter wire to 0.003 inch foil. Kirkendall void formation was experienced after diffusion heat treatment with specimens bonded with pure palladium foil; nickel diffused into the intermediate faster than palladium diffused into the nickel, and a line of vacancies was formed in the TD nickel adjacent to the interface. However, with the Pd-Ni foil no void formation was evident after 1-1/2 hours at 2350°F.

The voids shown in Fig. 2 are not typical of Kirkendall void formation in this system; voids are large and any Kirkendall void formation would be expected

B (continued)

NiB, Ta, Cb, Mo   60581   Card 3/13

in the TD Nickel rather than the intermediate. Palladium has high solubility
for hydrogen which decreases with nickel content. Void formation can be explained
by solution of hydrogen in the intermediate during di
subsequent precipitation at the interface as nickel d
of diffusion heat treated specimens fell to approxima
with strengths of 66,000 psi in the as-bonded conditi

WARNING
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WARNING

...

Elevated temperature and cryogenic tensile data has been gathered together with room temperature and elevated temperature lap shear and lap peel data. High and low temperature tensile data have been plotted graphically, and mechanical properties of as-bonded joints compared with joints exposed for 10 hours to elevated temperature heat treatments. [ductility]

...

[15 pages, 9 tables, 14 figures]
[Disposition - Shelf]
RME/RTN-mjc
August 4, 1965

N1B, Ta, Cr, Nb

60581

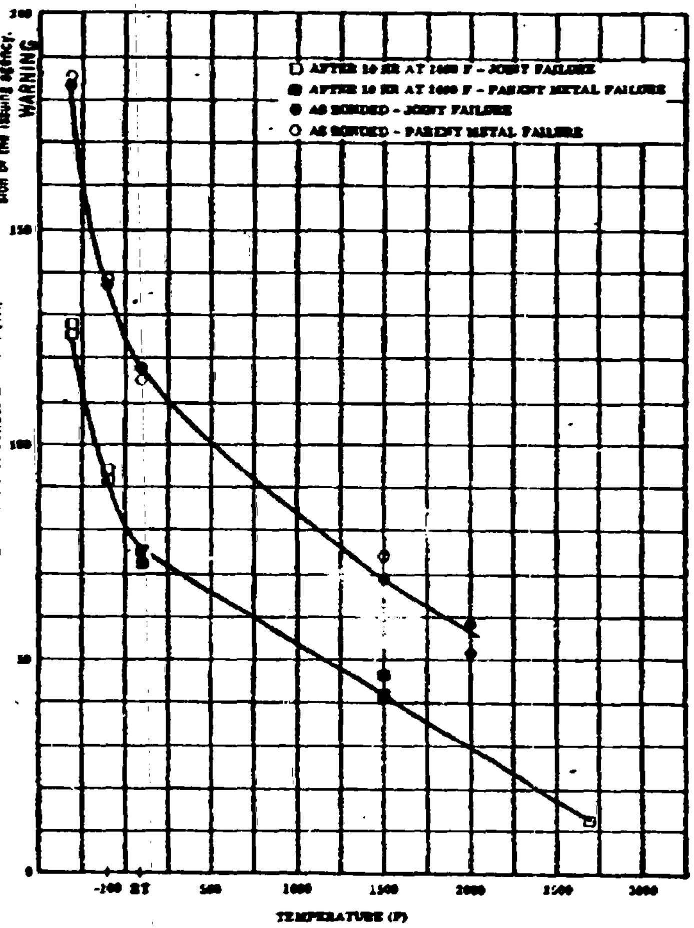

FIGURE 5. THE EFFECT OF DIFFUSION HEAT TREATMENT ON 90TA - 10W BONDED WITH 0.0003 INCH TANTALUM INTERMEDIATE FOIL

Accessions List

27896
F. C. Hardtke, Argonne National Lab., Argonne, Ill.
THERMOELECTRICITY IN IRRADIATED DIELECTRICS. I. SOME GENERAL FEATURES
The Journal of Chemical Physics, 42, (9), May 1, 1965, pp 3000-3009

A transitory charge displacement has been observed in gamma-irradiated solid dielectrics when the 3.2-mm-thick samples are heated subsequently in temperature gradients of 5 to 40 C/mm. Several glasses melted in our laboratory and a few commercial glasses were irradiated at room temperature in a cobalt-60 radiation facility at an exposure rate of 1×10^5 R/h. The charge displaced was found to be directly proportional to the temperature gradient and, below a megaroentgen, to the radiation exposure. With further exposure it approaches a maximum of a few nanocoulombs per square centimeter. Electric fields above 100 V/mm applied to the sample during heating produce only slight changes in the magnitude of the thermoelectric discharge. A marked reduction in the discharge magnitude is observed in samples that are shielded from the radiation source by metal plates approximately 0.1 g/cm^2 thick. This suggests that the phenomenon may arise from the thermal release of trapped electrons which have entered the sample as Compton recoils.

ORGANIC MATERIALS

27897
J.J.J. Myron and G. R. Freeman, University of Alberta, Edmonton, Alberta, Canada
THE RADIOLYSIS OF ETHANOL IV. DEUTERATED ETHANOLS IN THE LIQUID AND GAS PHASES
Canadian Journal of Chemistry, 43, (5), May, 1965, pp 1484-1492

The value of G(-ethanol) in the vapor phase is nearly double that in the liquid phase. Part of the difference appears to be due to the recombination of radicals in liquid cages. Ethanol molecules, on the average, break into smaller fragments in the gas than in the liquid phase radiolysis. The isotopic compositions of the hydrogen produced from various deuterated ethanols are consistent with the suggestion that the reaction $CH_3CH_2OH^+ + CH_3CH_2OH \rightarrow CH_3CH_2OH_2^+ + CH_3CH_2O$ occurs to a significant extent in the liquid not not in the gas phase. This reaction probably involves the shift of a hydrogen atom along a hydrogen bond. The reaction $C_2H_5OH_2^+ + e_{solv}^- \rightarrow C_2H_5^{\wedge} + H_2$ does not occur to an appreciable extent in the liquid phase. In the liquid phase the relative contributions of the three different groups in the ethanol molecule to hydrogen production are in the order $CH_2 > OH \gg CH_3$. A similar trend occurs in the gas, although the contributions of the three groups are more nearly equal in this phase. Isotope effects, in the range $k_H/k_D = 2.2$-3.9 per bond, occur in the methane formation mechanism. The isotope effects are somewhat smaller in the liquid than in the vapor phase and somewhat smaller in the inhibited than in the uninhibited systems. A comparison of product distributions in the liquid and gas radiolyses of several compounds by γ-rays and by α-particles indicates that L.E.T. effects can also occur in the gas phase. Ethanol and its solutions were irradiated at a temperature of 105 ± 3 degrees and a pressure of about 800 Torr. The liquid ethanol samples were irradiated at 28 degrees. The dose rate in the Gammacell-220 was about 6×10^{19} ev/g h for both liquid and gas samples.

C-2a
REIC Coordinate Index

[illegible]
Mathematical Analysis see Theoretical Analysis
Mechanical Properties see also specific properties
27571 27762A 27762B 27884 27910
Mercaptoethylamantidine [illegible]
Mercury Oxalate
27579
Metal Films
27584
Metals
25640 25641 25642 25643 25644 25645 25646 25647 25638 25639
26270 26271 26322 25721 25724 25765 25766 25767 25648 25760
26270 26321 26632 25763 25764 26653A 26264 26667 25698 26268
27232 26431 27222 25771 26264 26665B 27168 26267 25769 26319
27761 27761 27752A 26266 26264 26665C 27566 27167 26268A 27169
27784 27931 27762B 26681 26665 27567 26269B 27569
27894 27892 26683 26275 27757 26269C 27759
27565 26268C 27880
27925 27168
27568
27758
27808
Meteoroids see Micrometeorites
Methanol
27898 25779 27890
Methylaniline
27186
Methyl Bromide
26646
Methylcyclohexane
26671
Methylene Diol Polyesters
25776
Methylenedianiline
27808 27179
Methylpentanes
25776
Methyl Silicone
25770
Methylstyrene
27776
Methyltetrahydrofurans
27602
Mica
27801 27602 25638
27601 27022 25758
Microcircuits see Integrated Circuits
Microcracks
27767B
Microelectronics see Integrated Circuits
Microhardness
25770
Micrometeorites
25696 27817 25118
Micromodule see Integrated Circuits
Microstructure
25638
Microwave Devices
26086 27196
Mild Steels
25648
Minority Carriers
25742 25681 26676 25795 25796 25749
26666
Mobaloy Al-AN7
26647
Modulus of Elasticity
26271 25794 26069
27764
Molecular Weight
26651
Molybdenum
27801 25771 27567 26268
26683 27568
Molybdenum Alloys
27892 27925 27757
Molybdenum Disulfide
26683 25698
26683
Molybdenum Permalloy
27761
Molybdenum Sulfide
27790
Monomers see Organic Compounds
Monte Carlo Codes
27910 25712 27574 27216 25757 27869
26677
Motors
27804 26095 27808
Multiplexes
27210
MURA
26100 26101 26102 26103 26104 26105 26106 26097 26098 26099
26110 26111 26107 26108 26109
Mylar see also Ethylene Terephthalate Polymers
25671 27602 26284 25754 26095 26647
27701 26677
Napthalene
27777 27178
Narmco A
26647
Neoprene Rubber
26082
NERVA
27791 25672 27703
Neutron Dosimeters
26312 27765 26687 27608
Neutron Spectrometer
26314
Neutron Spectrum
26086 27918
Neutron Transport
27811
Nickel
25790 27222 26083 26264
27760
Nickel Alloys
26270 27761 27762A [illegible]
27780
Nickel Oxalate
27584
Nil Ductility Transition Temperatures see also Transition Temperatures
25791 [illegible]
Nimbus
27199
Niobium Alloys
25748
Nitrogen
26091
Nitrogen Compounds
27601
Nitrogen Dioxide Product
25714
Nitrogen Ions
26669
Nitrogen Trifluoride Product
27912
Nitrous Oxide
27911
Noise
25761 26684
Nondestructive Testing
27713
Notch Ductility see also Ductility
26063 25764 26277
Notch Tensile Properties see Tensile Properties
Nuclear Aerospace Research Facility
27612
Nuclear Bursts see also Pulsed Radiation in Section I for Simulated Bursts and also High Altitude Nuclear Explosion
25761 27106 25606 27797 25709
27336 27910
Nuclear Magnetic Resonance
26654
Nuclear Physics
27913
Nuclear Vehicles see specific kinds
Nuclear Rockets
27705
Nuclear Weapons Systems
27714
Nuvistor
27806 27509
Nylon-6
26651
Optical Absorption
27578 25659
Optical Materials
27024
Optical Properties
26120 27173 26095 25810
26805
Organic Compounds
25660 26071 26072 26073 25774 25655 25656 25657 25658 25659
26280 26641 26642 26643 26074 25775 25776 25727 25728 25729
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27180 27771 27909 27903 27774 27575 27178 26077 26278 26279
27580 27901 27775 27177 27178 27179
27900 27577 27578 27579
27907 27808 27890
Organic Products
25710 26071 26072 26643 25774 26075 27176 25657 25658 25726
26280 26641 27772 27773 27774 27575 25777 25728 26279
26640 27181 27909 27775 27577 25770 27179
27580 27771 26278 27890
27900 27178
27578
27808
Organotin Compound Products
25710
O-rings
27182 27804
ORION Nuclear Pulse Engine
27217
Ozalid
26647
Oscillators
25740 27211 26280 26203
26300
27210
Oxidation
25710 27879
Oxygen
27987
Oxygen for Oxygen Environment see In Oxygen
25774 25771
Ozone Formation
25713 26335
Packaging
25686 25667 26683 26680
Paraffin Oil
27711
Paraffins
27918
Paramagnetic Resonance Spectra
27791
27797
Paraplex P-43
27797
Particle Accelerators see Accelerators
Particle Detection see specific devices
Pentanes
25720
Penton
25731
Pentynes
26280
Perchlorates
27191 27192
Perchloric Acid
26082
Perfluorocyclohexyl
26277
Perfluorobiphenyl
26277

Explanation of REIC Coordinate Index

PART II

COORDINATE INDEX

INTRODUCTION

The REIC staff have determined that the Monthly Accession List is being used for retrospective searches as well as a current awareness facility. Consequently, the staff and the sponsor feel that an adequate index should be supplied to serve as a rapid search tool.

The following inverted concept-coordinate index is based upon terms generated in the REIC subject files. The index is cumulative throughout the year, and the staff will provide a "dual dictionary" at the end of each contract year to facilitate the retrospective search capabilities for the accession list abstracts.

The index is subdivided into two sections. The first, Radiation Environment, includes dosimetry and energy aspects of all electromagnetic and particulate radiation sources, with the exception of space radiation. Section two deals with materials, properties, secondary environment (including space environments), devices, and all other subject concepts. An author section and a generating organization section will be added to the index quarterly.

Under each concept term in the index are listed the accession numbers of the abstracts which have been indexed by that term. Links have been added where necessary to obviate improper cordination with the resulting false retrieval. Experience demonstrated that only four of the proposed EJC standard role indicators would have been required with any significant number of the entries.

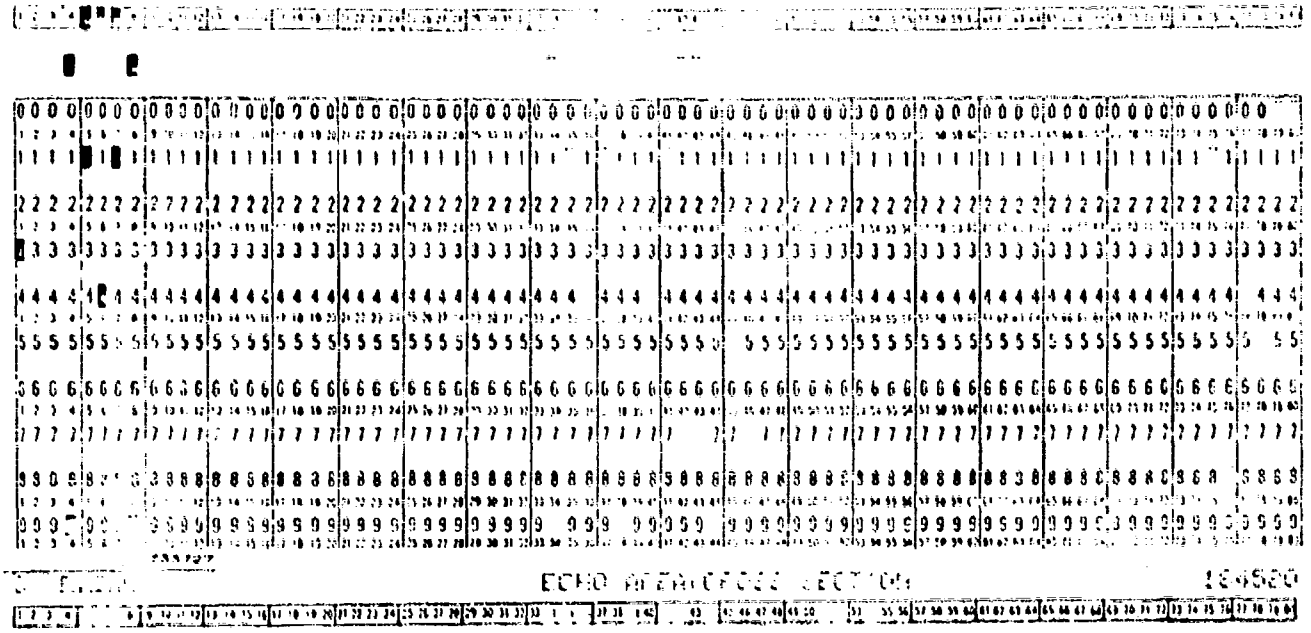
To use the index, take those terms, authors, organizations, etc. which collectively describe the idea, or ideas, for which the search is required. A comparison of the accession numbers will show those abstracts whose accession numbers are common to all desired terms. These abstracts should contain information on the desired subject matter.

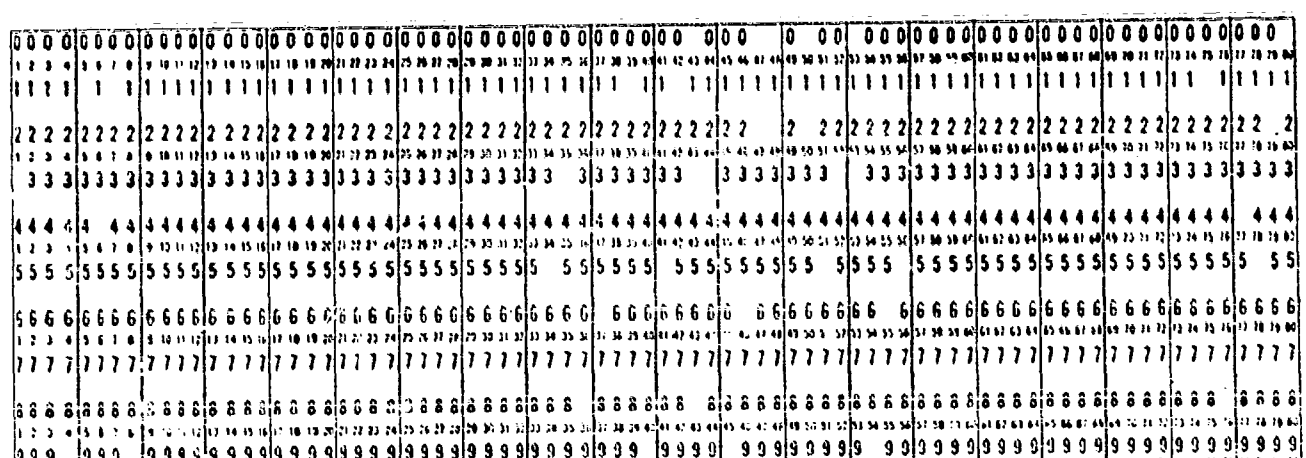
Two important facts must be remembered in the use of this coordinate index:

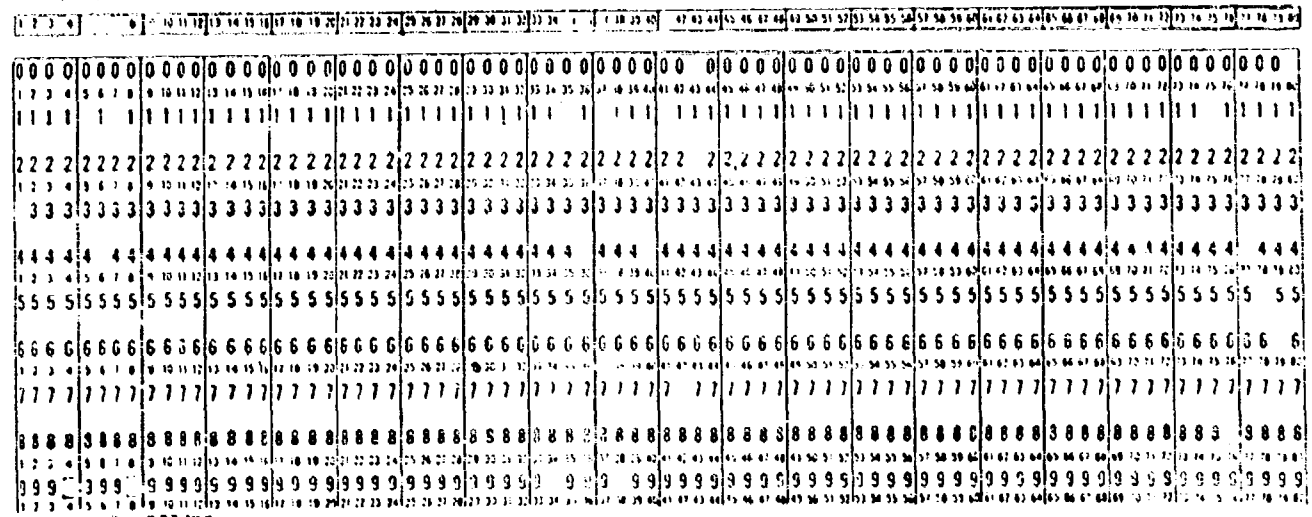
(1) This is a SELECTED ACCESSION LIST. Not all the documents extracted for the REIC File are abstracted for inclusion in this list. Approximately forty per cent are felt to be inappropriate. Consequently, to insure completeness in any search, it is essential that the REIC be contacted.

(2) This dissemination service is not intended to replace direct contact at the various locations remote to the Center. Direct contact with the Center and its technical staff is encouraged.

RACIC Clue-Word List Format

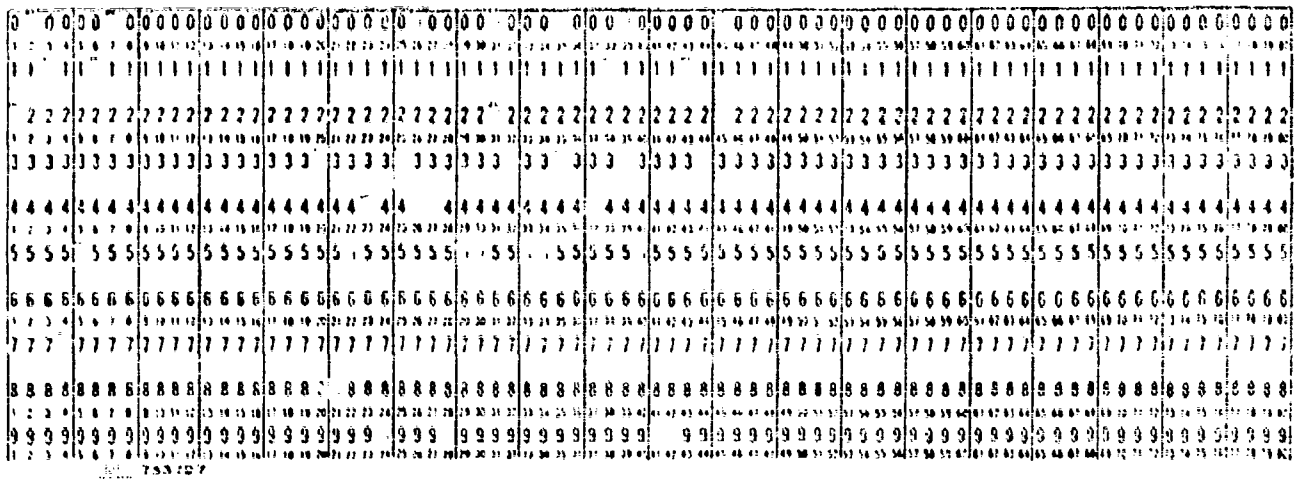




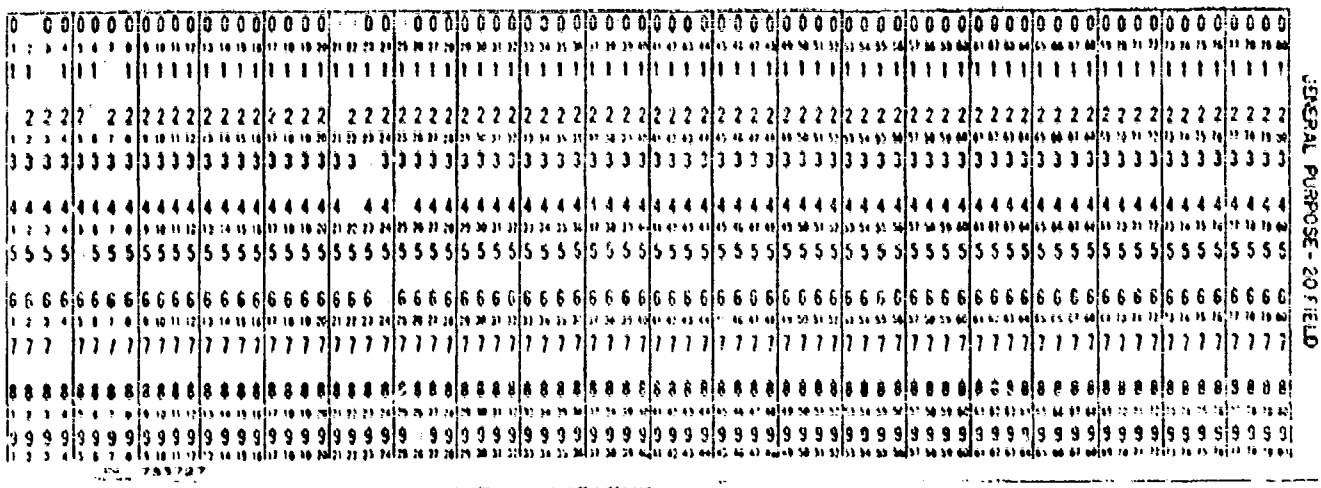


PACKS
SOURCE
SUPPLY
POWERLINE SECURITY
POWER WAGON
PPS
PPS-4 AN/PPS-4
PQS
PR
PR-155
PR-156
PRC
PRC-06 AN/PRC-06
PRC-09 PRC-09
PRC-10 AN/PRC-10
PRC-25 AN/PRC-25
PRC-35 AN/PRC-35
PRC-64 AN/PRC-64
PRECIPITATION
PRESERVATIVE
PRESS
PRESSURE
PRESTIGE
PRINTER/PRINTING
PRISON/PRISONERS
PROBLEMS
PROCUREMENT
PROGRAM/PROGRAMMING
PROJECTILE
PROJECTOR
PROPAGANDA
COMMUNIST
DISSEMINATION
PROPAGATION
RADIO
TROPICAL
PROPELLANT
PROPELLER
PROPERTY
PROPULSION
PROSYMS (PROJECT)
PROTECTION
PROTEINS
PROTOGA
PRS
PRS-4 AN/PRS-4
PRT
PSYCHOCHEMICAL
PSYCHOLOGICAL
EFFECT
OPERATION
WAR
WARFARE EQUIPMENT
WARFARE OPERATIONS
PUBLIC ADDRESS SYSTEM
PUBLIC INFORMATION
PUBLIC ORDER
PUBLIC RELATIONS
PUBLIC WELFARE
PUBLICATION
PULMONARY
PULSE
PUMP
PURCHASE
PURPLE
PURSUIT
PYROPHORIC
PYROTECHNICS
QUESTIONNAIRE
QUICK-FIX
RACE/RACIAL
RADAR
AIRBORNE
AIRBORNE RADAR
RADAR DETECTION OF PERSONNEL
DOPPLER PERSONNEL SURVEILLANCE
RADAR MAPPING
ECHO AREA-CROSS SECTION..
RADAR MAPS
MAP
RADAR METEOROLOGY (WEATHER)
MTI RADAR
MTI
NAVIGATION RADAR
OPTICAL RADAR
SET
RADAR PHOTOGRAPHY
RADAR SET
SIDE-LOOKING RADAR (SLR)
SIDE-LOOKING
SURVEILLANCE
SURVEILLANCE RADAR
RADIATION
RADIO
EQUIPMENT
FREQUENCY
HAMLET
JUNGLE
MAN-PACK
RELAY
RYAN RIFLE-BUTT
SET
SET 77 AM
STATION

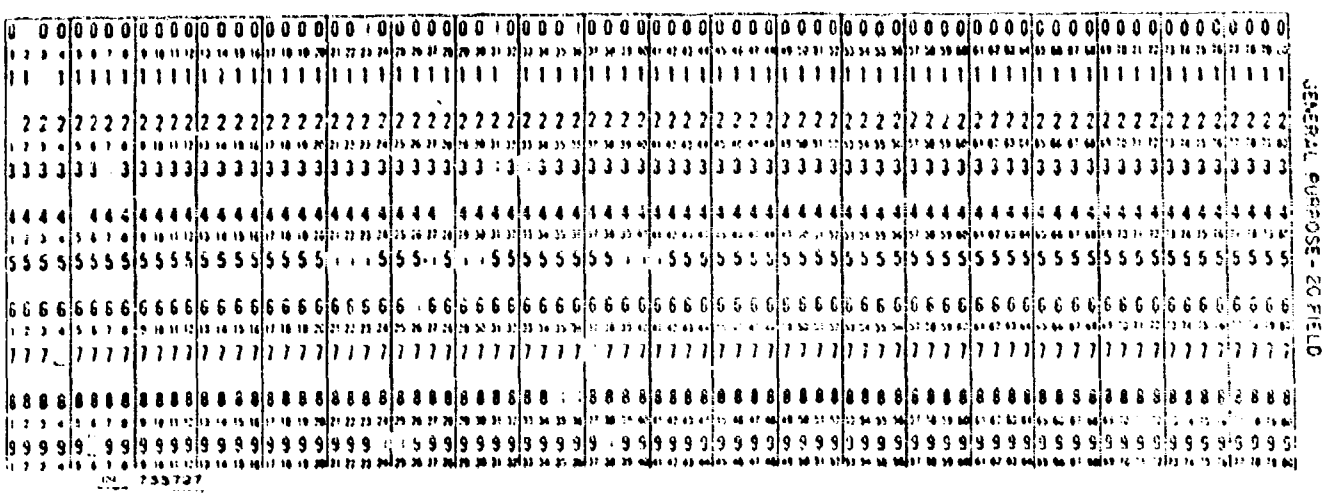
Samples for Experimental RACIC Clue-Word Coordinate Index



SULFUR



ENVIRONMENTAL HYGIENE



D-1

RACIC Card Format and Card Type Code

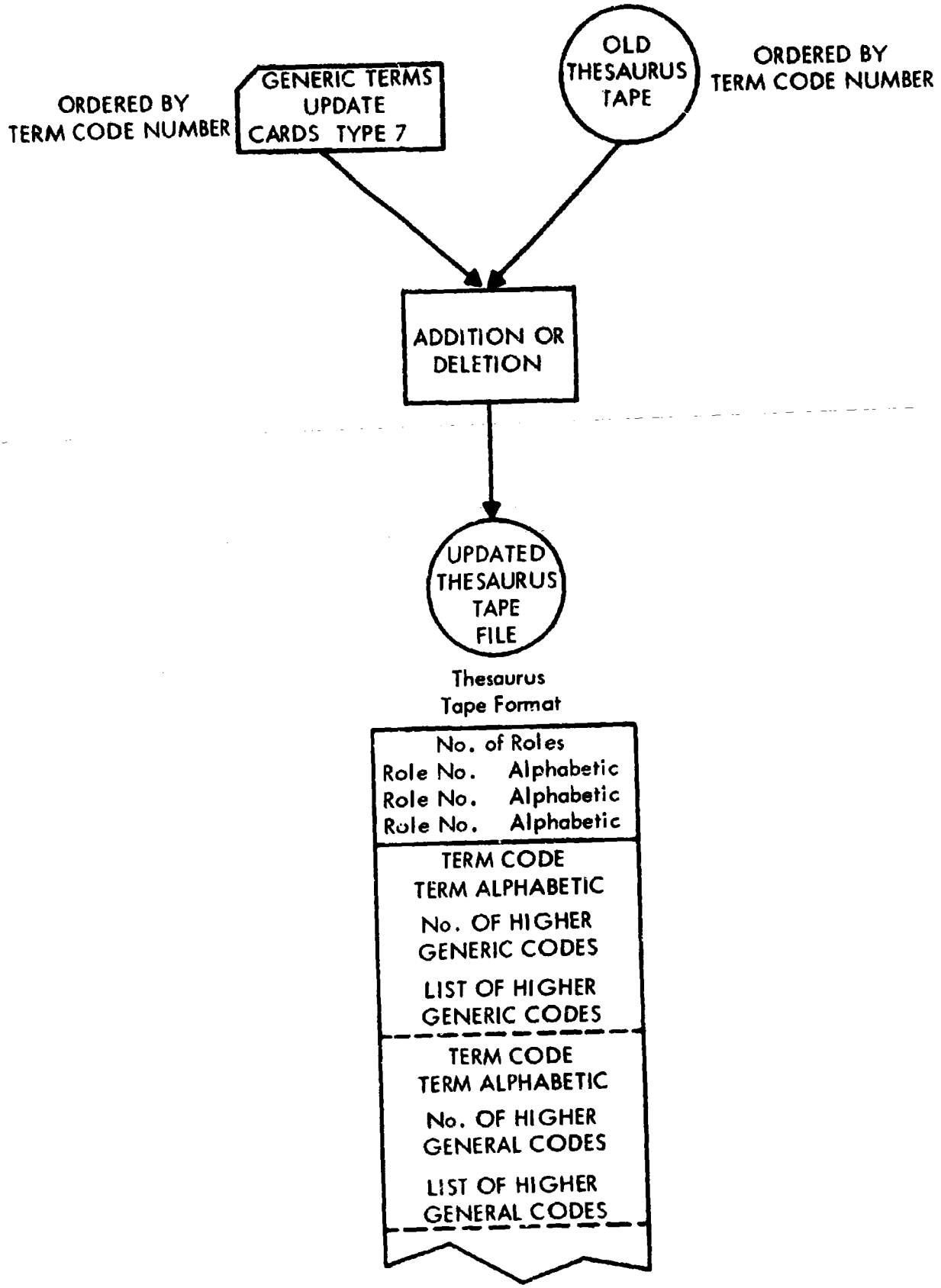
General Card Format

Card Columns	Description
1-7	Accession Number
8-9	Link Code
10-11	Role Code
12-18	Term (clue word) Code
19	Sequence Number
20-79	Term Alphabetic
80	Subsection ID

Summary of Index Card Input Codes

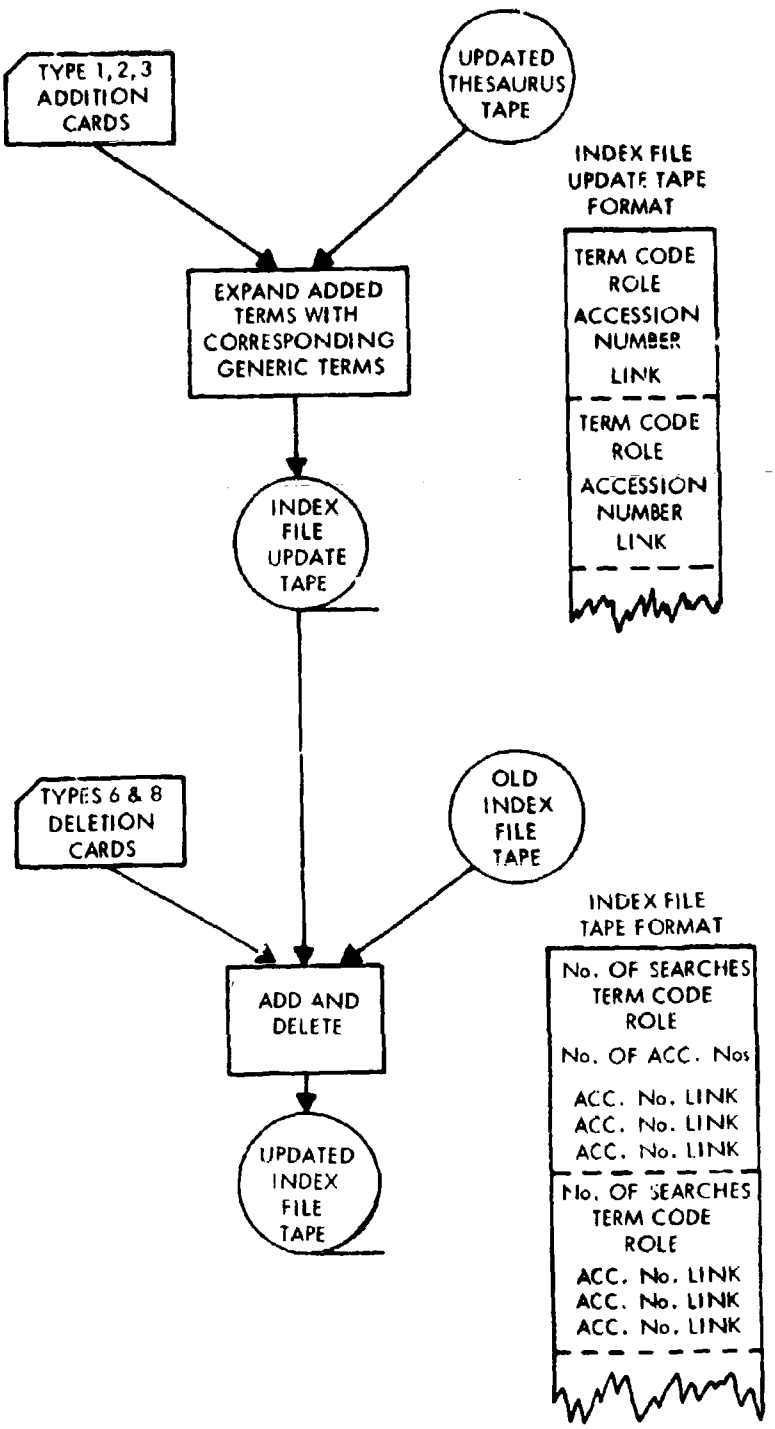
Type Code Number	Description
1, 2, 3	Add accession number-link-term code-term alphabetic to index tape
6	Delete accession number-link-term code-term alphabetic from index tape
8	Delete accession number and link
9	Search

RACIC Update Thesaurus Run and Thesaurus Tape Format

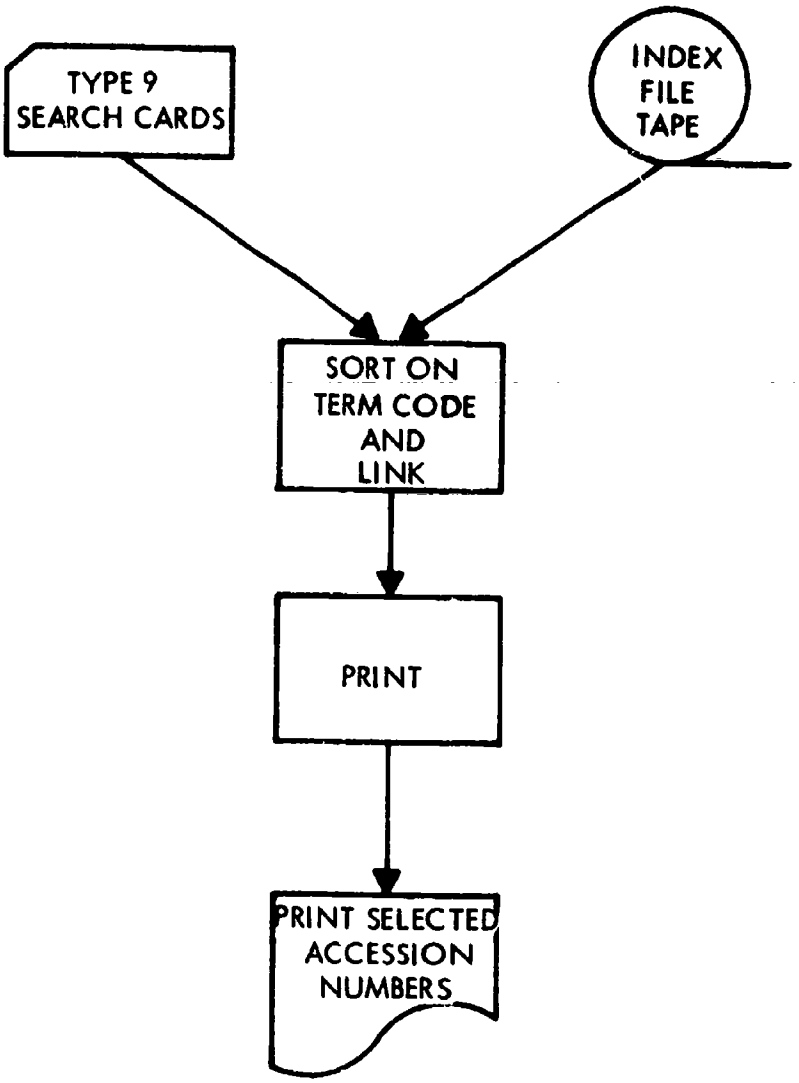


D-3

RACIC Generic Posting Generation and Update Index File Runs and Index File Tape Formats

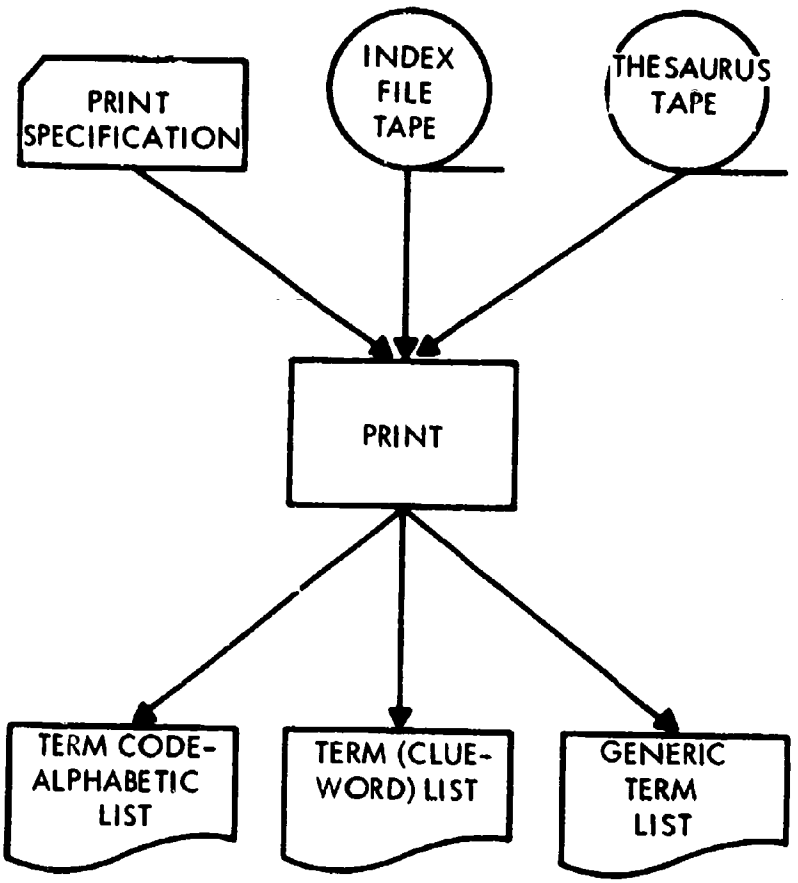


Search and Retrieval Run



D-5

Print Files Run



DMIC Bibliographic Record

C C C C C R/5710/112963/OFR/68-4/N600/9361 T 052951 C

C

T J. A. Ford S S R. W. Hertsbert S S F. D. Lemkey C

C

T Analytical and Experimental Investigations of the Fracture C

T Mechanisms of Controlled Polyphase Alloys C

C

T United Aircraft Corp. S S S Final Report, Report No. B910068-4 S S C

T (October 29, 1962-November 29, 1963), November 29, 1963 S S S C

T Bureau of Naval Weapons, S S S N600(19)59361 C

C

* T Cm S S S Cr-Cr23-Cr6 S S Cu-Cr System S S fracture S S metallographic C

T S S Al-Al3Ni System S S modulus S S Al-CuAl2 System S S electron C

T fractography S S whisker S S tensile properties S S toughness S S C

T modulus of elasticity B B B

S stands for space, C stands for carriage return,
T stands for tabulate shift and B stands for backspace.

(*) The typist would, at this point, turn off the punch mechanism and store the tape pending completion of the extract. At that time the fourth variable field would be added to the tape.

Unclassified
Security Classification

DOCUMENT CONTROL DATA - R&D

(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)

BOOZ ALLEN APPLIED RESEARCH, INC. 4733 Bethesda Avenue Bethesda, Maryland 20014	Unclassified

Mechanization Study of the DMIC, BDIC, RACIC and REIC Information Centers of the Battelle Memorial Institute, Columbus, Ohio.

Final Report of on-site survey

G. A. Kershaw, D. Crowder, J. E. Davis, E. G. Loges, E. Merendini, S. M. Thomas

September, 1966	47	4
DSA-7-15489	914-1-18	
	AD 640 113	

Distribution of this Document is unlimited

None	Defense Supply Agency Defense Documentation Center Cameron Station, Virginia

Four of the information centers operated by the Battelle Memorial Institute were included in the library mechanization study. The CDC 3400 computer is used for any mechanization although this was not extensive at the time of the survey. A Flexowriter is used by BDIC to produce a monthly list of documents for security classification downgrading and by REIC to produce a monthly accessions list with abstracts and coordinate index, and a semiannual compilation of government-sponsored contracts relative to radiation-effects research. RACIC uses Flexowriter edge-punched cards to produce a security log of secret cards in the file. DMIC uses a Termatrex coordinate index system to store and retrieve references to government-sponsored contracts of interest to the Center. REIC uses a mechanized process to punch EAM cards which are used to produce a listing of clue words and a listing of reports with accession numbers. REIC has also initiated the development of a thesaurus. RACIC has mechanized its listing of clue words and is experimenting with a computer program to produce a clue-word coordinate index from a file of EAM punched cards. All four centers consider that their manually produced and searched files of extracts are preferable to a computerized system. However, they feel that additional mechanization of their printed outputs would be desirable as a time-saving feature wherever it would prove economical.

DD FORM 1473

Unclassified
Security Classification

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Security Classification

[illegible]	[illegible]	[illegible]	[illegible]

Information Retrieval
Digital Computers
Indexes
Dictionary
Electronic Accounting Machines

INSTRUCTIONS

1. ORIGINATING ACTIVITY: Enter the name and address of the contractor, subcontractor, grantee, Department of Defense activity or other organization (corporate author) issuing the report.

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2b. GROUP: Automatic downgrading is specified in DoD Directive 5200.10 and Armed Forces Industrial Manual. Enter the group number. Also, when applicable, show that optional markings have been used for Group 3 and Group 4 as authorized.

3. REPORT TITLE: Enter the complete report title in all capital letters. Titles in all cases should be unclassified. If a meaningful title cannot be selected without classification, show title classification in all capitals in parenthesis immediately following the title.

4. DESCRIPTIVE NOTES: If appropriate, enter the type of report, e.g., interim, progress, summary, annual, or final. Give the inclusive dates when a specific reporting period is covered.

5. AUTHOR(S): Enter the name(s) of author(s) as shown on or in the report. Enter last name, first name, middle initial. If military, show rank and branch of service. The name of the principal author is an absolute minimum requirement.

6. REPORT DATE: Enter the date of the report as day, month, year, or month, year. If more than one date appears on the report, use date of publication.

7a. TOTAL NUMBER OF PAGES: The total page count should follow normal pagination procedures, i.e., enter the number of pages containing information.

7b. NUMBER OF REFERENCES: Enter the total number of references cited in the report.

8a. CONTRACT OR GRANT NUMBER: If appropriate, enter the applicable number of the contract or grant under which the report was written.

8b, 8c, & 8d. PROJECT NUMBER: Enter the appropriate military department identification, such as project number, subproject number, system numbers, task number, etc.

9a. ORIGINATOR'S REPORT NUMBER(S): Enter the official report number by which the document will be identified and controlled by the originating activity. This number must be unique to this report.

9b. OTHER REPORT NUMBER(S): If the report has been assigned any other report numbers (either by the originator or by the sponsor), also enter this number(s).

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13. ABSTRACT: Enter an abstract giving a brief and factual summary of the document indicative of the report, even though it may also appear elsewhere in the body of the technical report. If additional space is required, a continuation sheet shall be attached.

It is highly desirable that the abstract of classified reports be unclassified. Each paragraph of the abstract shall end with an indication of the military security classification of the information in the paragraph, represented as (TS), (S), (C), or (U).

There is no limitation on the length of the abstract. However, the suggested length is from 150 to 225 words.

14. KEY WORDS: Key words are technically meaningful terms or short phrases that characterize a report and may be used as index entries for cataloging the report. Key words must be selected so that no security classification is required. Identifiers, such as equipment model designation, trade name, military project code name, geographic location, may be used as key words but will be followed by an indication of technical context. The assignment of links, rules, and weights is optional.

Security Classification